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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,508	10/18/2001	Masaou Matsuda	358362010400	5230

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EXAMINER	
BOYD, JENNIFER A	
ART UNIT	**PAPER NUMBER**
1771	

DATE MAILED: 01/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/889,508	MATSUDA ET AL.	
	Examiner	Art Unit	
	Jennifer A. Boyd	1771	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4 and 6-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4 and 6-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The Applicant's Amendments and Accompanying Remarks, filed November 8, 2005, have been entered and have been carefully considered. Claims 1, 8, 10 and 11 are amended, claims 3 and 5 are cancelled and claims 1 – 2, 4 and 6 – 12 are pending. In view of Applicant's argument that Leumer does not teach a copolymerized polyester with a phosphorus atom in a *side chain*, the Examiner withdraws all previously applied rejections as being anticipated or obvious over Leumer as discussed in the previous Office Action. The previously applied rejections as obvious over Tashiro have been amended below in light of Applicant's amendments and for clarification purposes. The invention as claimed is not found to be patentable for reasons herein below.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 1, 2, 4, 6, 8 and 11 - 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tashiro et al. (US 4,721,746) in view of Leumer (US 5,658,662).

Tashiro is directed to flameproof synthetic fiber (Title).

As to claim 1, Tashiro copolymerizing a phosphorus compound with the polymer constituting the synthetic fiber (column 3, lines 65 – 67 and column 4, lines 1 – 5). Tashiro teaches that the synthetic fiber can be polyester (column 3, lines 15 – 25). Tashiro teaches that

the phosphorus is present in the amount of 0.5 – 7.0% (5,000 – 70,000 ppm) by weight (column 6, lines 30 – 50).

As to claim 2, Tashiro teaches a phosphorus compound as shown by Formula IV (column 3, lines 1 – 10 and column 5, lines 45 – 55).

As to claim 8, Tashiro teaches in Examples 29 and 33 that the polyester yarn of the invention can be woven (columns 15 and 18).

As to claim 11, Tashiro teaches that the synthetic fiber is particularly useful for nonwoven fabrics (column 20, lines 10 – 14).

Tashiro fails to teach that the take-up speed is 1000 – 4500 meters/minute as required by claim 1. Tashiro fails to teach that the draw ratio is not more than 2.88 and has a setting temperature of not less than 150 degrees C as required by claim 12.

Leumer is directed to a high tenacity, low flammability polyester yarn, production thereof and use thereof (Title). Leumer teaches a polyester formed from dicarboxylic acid and diol, which contains, in the polymer chain, units of formula I (column 3, lines 25 – 35). See column 3, lines 29 – 35 for formula I. Leumer teaches that the polyester yarn is spun at a take-up speed above 300 m/min, preferably from 500 – 1500 m/min (column 8, lines 45 – 54). Leumer teaches in the Examples the use of 3% (or 30,000 ppm) of the phosphorus compound (Table 1). Leumer teaches a breaking extension within the range of 5 – 30% (column 5, lines 20 – 25).

Leumer teaches that the polyester is melt spun and heat set at a temperature ranging from 225 – 240 degrees Celsius (column 8, lines 50 – 65 and column 9, lines 1 – 5). The total draw ratio is from 1:4.5 to 1:6 (column 8, lines 60 – 65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to create the copolymerized polyester with a phosphorus atom in a side chain of Tashiro with a take-up speed of greater than 300 m/min, in particular at a spinning take-off speed from 500 – 1500 m/min as suggested by Leumer motivated by the desire to create a flame-retardant polyester fiber at a spinning speed which reflects current spinning capacities in order to improve production speed and having a low shrinkage level which is suitable for industrial fabrics (see Leumer, column 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to create the copolymerized polyester with a phosphorus atom in a side chain of Tashiro with a draw ratio between 1:4.5 to 1:6 as suggested by Leumer motivated by the desire to create a flame-retardant polyester fiber with a low shrinkage level which is suitable for industrial fabrics (see Leumer, column 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to create the copolymerized polyester with a phosphorus atom in a side chain of Tashiro with a heat setting temperature of 225 – 240 degrees C as suggested by Leumer motivated by the desire to create a flame-retardant polyester fiber with high tenacity and a broad, process-adjustable spectrum of thermal shrinkage which is suitable for industrial fabrics (see Leumer, column 9).

As to claims 1, 4 and 6, although Tashiro in view of Leumer does not explicitly teach the claimed properties detailed by the following formulas: $\tan \delta_{max} \geq 0.236$, $T\alpha - 3.77 \times \ln(dtpf) \leq 137.0$ and $1.331 \leq SG - \sqrt{\Delta n}/8.64 \leq 1.345$ as required by claim 1, a property of having not less than 7720 times up to an occurrence of cutting by abrasion under a load of 0.098 N/tex in a yarn abrasion test as required by claim 1, a shrinkage in hot water (SHW) of not more than 10% as required by claim 1, a tensile elongation at break of 20 – 50% as required by claim 4, the polyester meets the requirements of formulas 4 – 5 as required by claim 6, it is reasonable to presume that the properties discussed above are inherent to Tashiro in view of Leumer. Support for said presumption is found in the use of like materials (i.e. a fiber comprising polyester copolymerized with phosphorus, wherein the phosphorus is present in the amount of 5,000 – 70,000 ppm) which would result in the claimed properties. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed properties would obviously have been present once the Tashiro in view of Leumer product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977). It should be noted that at this time the Examiner cannot search fiber fineness and density requirements because the values of those parameters are represent format in which they are dependent on inherent values.

It should be noted that even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same or an obvious variant from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964,

966 (Fed. Cir. 1985). The burden has been shifted to the Applicant to show unobvious differences between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289, 292 (Fed. Cir. 1983).

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tashiro et al. (US 4,721,746) in view of Leumer (US 5,658,662), as applied above, and further in view of Buxbaum (US 4,101,526).

Tashiro in view of Leumer teaches the claimed invention above but fails to teach the use of an organic fluorescent brightener in a proportion of 0.01 – 1 wt % and, as a condensation polymerization catalyst, the combination of antimony compound, a germanium compound and a cobalt compound in the amounts that simultaneously satisfy formulas 6 - 9 in claim 7.

Buxbaum is directed to a process for manufacturing a linear polyester containing phosphates suitable for use in the form of a filament (Abstract and column 7, lines 50 – 60). Buxbaum teaches that metal compound mixtures comprising cobalt, germanium and antimony can be employed in the polyester in the amount of 0.001 to 1% by weight (column 6, lines 14 – 20). Buxbaum teaches that other additives can be included such as fluorescent whitening agents (column 7, lines 5 – 15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include an organic fluorescent brightener as suggested by Buxbaum in the polyester of Tashiro in view of Leumer motivated by the desire to create a properly whitened polyester to achieve maximal dyeing color uptake and color integrity.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a catalyst comprising antimony, germanium and cobalt as suggested by Buxbaum in the polyester of Tashiro in view of Leumer motivated by the desire to create a high polymerization rate.

Tashiro in view of Leumer and Buxbaum discloses the claimed invention except for the level of fluorescent brightener present in the polymer is 0.01 – 1% by weight and that the amount of antimony, germanium and cobalt compounds satisfy the following equations: $30 \leq S \leq 400$, $10 \leq G \leq 100$, $5 \leq C \leq 40$ and $200 \leq S + 2G + C \leq 400$. It should be noted that the amount of fluorescent brightener, antimony, germanium and cobalt compounds are result effective variables. For example, as the amount of brightener increases, the polymer becomes whiter and brighter. When the amount of the antimony compound added is less than the aforementioned range, the condensation polymerization becomes slow, and when it exceeds the above-mentioned range, the L value as measured with a Hunter's color-difference meter unpreferably decreases. When the amount added of the germanium compound is less than the above-mentioned range, the condensation polymerization becomes slow, and when it exceeds the above-mentioned range, the production cost becomes higher because germanium is extremely expensive, and the b value of the polymer unpreferably increases. When the amount added of the cobalt compound is less than the above-mentioned range, the b value of the color tone of the resulting polymer becomes high. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add the fluorescent brightener in the amount of 0.01 – 1% by weight since it has been held that discovering an optimum value of a result effective variable involves only routine

skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the present invention, one would have been motivated to optimize the amount of optical brightener to create a suitably white polyester and to optimize the levels of antimony, germanium and cobalt to create a cost efficient, properly tinted polyester which is polymerized in an efficient manner.

5. Claims 9 – 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tashiro et al. (US 4,721,746) in view of Leumer (US 5,658,662), as applied above, and further in view of Vogt (US 5,952,413).

Tashiro in view of Leumer teaches that the synthetic fiber of the present invention is useful for textile, filling, interior, woven and non-woven fabrics, artificial leather and artificial fur uses (Tashiro, column 20, lines 10 – 14 and Examples 29 and 33).

Tashiro in view of Leumer fails to teach that the woven or knitted fabric has undergone a raising treatment to create a sueded fabric as required by claims 9 and 10.

Vogt teaches a method of making a polyurethane suede-like material (Title). Vogt teaches that the textile fabric can comprise any synthetic fiber such as polyester (column 4, lines 45 – 48). Additionally, the fabric may be in any form such as woven, non-woven or knitted (column 4, lines 53 – 55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a raising treatment to create a sueded fabric as suggested by Vogt in the application of Tashiro in view of Leumer motivated by the desire to have an aesthetically pleasing and soft material.

Although Tashiro in view of Leumer and Vogt does not explicitly teach the claimed coefficient of friction of a surface of 0.200 – 0.300 as required by claim 9 and after-flame time of not more than 3 seconds as measured by the Applicant's test as required by claim 10, it is reasonable to presume that the claimed coefficient of friction of a surface of 0.200 – 0.300 as required by claim 9 and after-flame time of not more than 3 seconds as measured by the Applicant's test as required by claim 10 is inherent to Tashiro in view of Leumer and Vogt. Support for said presumption is found in the use of like materials (i.e. phosphorus-containing polyester woven fabric with a sueded surface) which would result in the claimed properties. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed property of the claimed coefficient of friction of a surface of 0.200 – 0.300 as required by claim 9 and after-flame time of not more than 3 seconds as measured by the Applicant's test as required by claim 10 would obviously have been present once the Tashiro in view of Leumer and Vogt product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977).

Response to Arguments

6. Applicant's arguments filed November 8, 2005 have been fully considered but they are not persuasive.

Applicant argues that Tashiro does not teach or suggest the phosphorus compound copolyester as claimed. Applicant discusses that Tashiro teaches a technique for imparting flame-retardance to a cloth by treating the cloth with an aqueous solution containing a phosphorus compound. It should be noted that Tashiro does teach superficial treatment of a fiber

with the phosphorus compound but Tashiro also teaches copolymerizing the phosphorus compound with the polymer constituting the synthetic fiber (see column 3, lines 65 – 68 and column 4, lines 1 – 5. Also see the discussion of melt spinning the copolymerized polymer with the phosphorus compound (column 7, lines 45 – 60).

Applicant argues that Tashiro with Leumer would not result in the claimed invention above. Tashiro teaches Applicant's claimed chemical structure. Leumer teaches Applicant's claimed process limitations and provides motivation to create the fiber of Tashiro with the claimed process limitations motivated by the desire to create an industrial fabric with the desired shrinkage and tenacity requirements. The burden is upon the Applicant to provide evidence that the fiber of Tashiro produced with the process characteristics of Leumer would not result in a polyester fiber that would satisfy the characteristics as recited in claim 1.

Applicant argues that Vogt does not teach or suggest the flame-retardant polyester fiber as recited in claim 1. It should be noted that the Examiner has relied on Tashiro to teach the flame-retardant polyester fiber and has used Vogt only as a secondary reference to provide motivation for applying a raising treatment to create a sueded fabric.

Applicant argues that Buxbaum does not teach or suggest a copolyester obtained by copolymerizing a side chain phosphorus compound. It should be noted that the Examiner has relied on Tashiro to teach the flame-retardant polyester fiber structure and has used Buxbaum only as a secondary reference to provide motivation for incorporating an organic fluorescent brightener in the polyester of Tashiro and to use a catalyst comprising antimony, germanium and cobalt.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Boyd whose telephone number is 571-272-1473. The examiner can normally be reached on Monday thru Friday (8:30am - 6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer Boyd
January 17, 2006

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